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ADDRESS

Delivered by the President, Professor A. S. Eddington, on the award of the Gold Medal to Dr. James Hopwood Jeans.

THE Council have awarded the Gold Medal to Dr. James Hopwood Jeans for his contributions to the Theories of Cosmogony.

The *Philosophical Transactions* for the year 1901 contain two consecutive papers on the pear-shaped figure of equilibrium of rotating liquid masses, the one by Sir George Darwin and the other by Henri Poincaré. The old problem of the succession of forms taken by a spinning mass of liquid was waking into new life; and the discussion as to whether the latest configuration—perhaps rather infelicitously described by the term “pear-shaped”—is a possible stable stage in the development of a star on its way to separation into a binary system, was shortly to become a burning question of the hour. It was at this period that J. H. Jeans, then Isaac Newton Student in the University of Cambridge, entered the ranks of astronomers, and, as was natural to a pupil of Sir George Darwin, became fascinated by the problem which was then opening up.

He had previously published work of great importance on the Dynamical Theory of Gases, a subject on which he is now one of the greatest authorities. I suppose that we must admit that astronomy can only lay claim to half of him—perhaps not even the larger half. Happily the two subjects go well together—an alliance nowhere more strikingly illustrated than in Jeans' researches—so that we lose nothing, and have gained much, by his faithfulness to his first love. And so his first contribution to the problem of stellar evolution called attention to some very different circumstances which arise when account is taken of the fact that actual bodies are compressible and often gaseous. The theory of rotating liquids was an important step towards understanding the behaviour of stars; but Jeans made it clear that much more remained to be done before the results could be applied with any certainty to actual bodies. His paper on the “Stability of a Spherical Nebula” showed that other causes of evolution were at work in a gas besides those allowed for in the more restricted problem of Darwin and Poincaré. This paper was noteworthy as introducing the conception of *gravitational instability*. There is a natural tendency for nuclei to form in an extended nebula and grow by attracting matter to themselves, so that we have another cause of separation of primitive material besides the possible fission through too rapid rotation.

A little later Jeans conceived the idea that it would be a valuable illustration of the behaviour of a rotating liquid mass if the corresponding two-dimensional problem were fully worked out instead of the heart-breaking actual problem of three dimensions. The investigation could